# Argentina, Mexico, And Currency Boards: Another Case of Rules Versus Discretion

**Carlos E. Zarazaga**
Senior Economist and Executive Director
of the Center for Latin American Economics
Federal Reserve Bank of Dallas

*Far more important than what governments say—or even enact into law—seems to be what governments do: actions speak louder than words or laws. A country's care for its reputation plays a far more important role than formal institutions in solving the time inconsistency problem and in providing governments with the incentives to adhere to policy rules despite the short-term temptation to do otherwise.*

In years to come, world financial markets will recall December 20, 1994, the day Mexico devalued its currency, as a landmark date in financial history. The devaluation inadvertently initiated what Michel Camdessus, managing director of the International Monetary Fund, aptly dubbed "the first financial crisis of the twenty-first century." Most analysts and economic advisors were surprised by not only the devaluation, but also the speed with which its effects spilled into other emerging economies. These effects took the form of swift and massive capital outflows, as investors withdrew savings from those countries in fear that they would devalue their currencies as well.

The *tequila effect*, as the Mexican crisis has come to be known in Latin America, has eroded the living standards of millions of people throughout the region.[1] Also affected, although to a lesser extent, are the countries and international organizations that quickly assisted Mexico with an unusual financial package. The damaging effects, actual or potential, of the Mexican crisis on so many people's welfare have caused the public, investors, and the press to question how Mexico's crisis happened, how it influenced other economies, and how to prevent a similar crisis in the future. The response of some analysts has been that the Mexican crisis and its daunting spillover effects would have been avoided had Mexico had a currency board-like system similar to the one Argentina adopted in 1991.

My goal in this article is to examine the currency board proposition in light of current economic theory and the experiences of Argentina and Mexico. In the first part of the article, I describe the monetary policies of those two countries and argue that Mexico was forced to devalue its currency while Argentina was not because Mexico managed its monetary policy with much more discretion than did Argentina, which managed monetary policy according to strict rules.

The seemingly obvious conclusion of the first part of the article is that all it takes to prevent exchange rate crises such as Mexico's is to guarantee that rules will take precedence over discretion. Currency boards, their advocates maintain, provide governments with the adequate "technology" with which to handle such a simple job.

In the second part of this article, however, I argue that this optimistic view is too naive because it overlooks the problem of time inconsistency,[2] a bit of economics jargon for policymakers' tendency to find good reasons to

repudiate plans they had promised not to abandon and policy rules they had vowed not to break. Governments always justify those inconsistencies with the same basic excuse: the abandoned policy rule was the best course in the conditions prevailing in the past but not for present circumstances.[3]

Currency boards are a monetary policy rule. As such they fail to resolve the time inconsistency problem because, despite claims to the contrary, currency boards cannot provide a quick and painless fix to the economic woes of countries that, like Mexico and Argentina, have long histories inconsistent with low-inflation targets. Quite to the contrary, implementation of rules in such countries is bound to be costly because the credibility of each country's economic policies depends more on the country's track record in honoring past commitments than on present institutional arrangements.

In fact, as I argue in the third part of this article, reputation is an important determinant of which rules are best for a country. In general, contingent policy rules or rules with (implicit or explicit) escape clauses are superior to noncontingent rules such as currency boards. But the recent experiences of Argentina and Mexico may suggest that implementation of the more flexible contingent rules is particularly difficult in countries that have inappropriately used in the past built-in escape clauses. By virtue of their poor track records, such countries may be limited to the use of noncontingent rules. Currency boards are one such rule, but certainly not the only one, and policymakers should carefully evaluate the merits and shortcomings of currency boards relative to other types of ironclad rules before recommending currency boards as the best rule for a country.

Whatever rule is chosen, countries that have lacked monetary discipline in the past and attempt to implement strict monetary policies eventually may suffer severe economic hardships. When problems arise, ironclad rules such as currency boards will be particularly susceptible to the time inconsistency problem. Countries will be able to overcome such problems only if their people are convinced that the concrete costs of sticking to the policy rule today will be outweighed by the potential gains that will accrue when investors' confidence is eventually regained. Unfortunately, this cost–benefit analysis is subject to considerably more dispute than currency board advocates sometimes recognize. Nonetheless, this article concludes on the optimistic note that Argentina's and Mexico's recent experiences may provide useful empirical evidence to validate or refute claims about currency boards, principles of time inconsistency literature, and theories about the superiority of rules over discretion.

## The monetary policies of Argentina and Mexico

**Currency boards: A devaluation-proof rule for money base creation.** A currency board is a policy rule for monetary base creation that guarantees that a country will not devalue under any circumstance while following that rule.[4] Under a currency board, monetary policy is run according to a very simple rule: the monetary authority issues money only against a designated reserve currency, such as the U.S. dollar or German mark, at a fixed exchange rate. This rule is formalized in the following equation:

$$(1) \qquad \frac{x}{\textit{Promised Exchange Rate}} = \textit{Stock of Reserve Currency},$$

where $x$ is the level of monetary base that satisfies the equality. In a country that runs its monetary policy according to a currency board rule, all policymakers need to do is print the amount of money that satisfies $x$ in equation 1. This rule implies that if the stock of reserve currency expands by 10 percent (say, due to a capital inflow), then the monetary authority must expand the monetary base by 10 percent. If, in contrast, the stock of reserve currency shrinks by 10 percent (say, due to a capital outflow), then the monetary authority must contract the monetary base by 10 percent. In other words, a currency board mechanism for expanding and contracting the monetary base ensures that the proportion of monetary base to reserves remains constant at the fixed exchange rate. To see this more formally, define

$$(2) \qquad MB\$FR = \frac{\textit{Monetary Base}}{\dfrac{\textit{Promised Exchange Rate}}{\textit{Stock of Reserve Currency.}}}$$

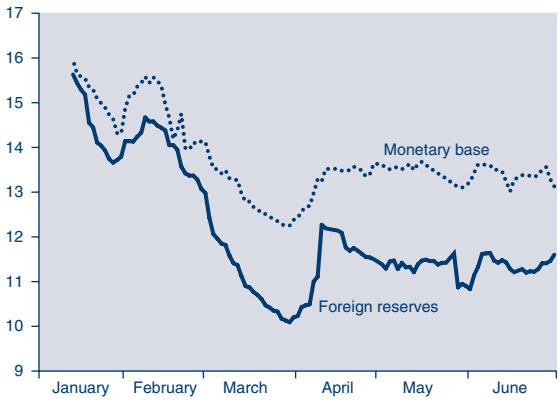
The left-hand term in this equation is the *MB$FR ratio*. A currency board simply instructs the monetary authorities to set that ratio equal to 1, so that

$$(3) \qquad MB\$FR = 1$$

becomes the currency board rule. The economic interpretation of this rule is that the monetary

Figure 1

**Argentina: Monetary Base And Foreign Reserves, 1995**




SOURCE: Central bank of Argentina.

base is fully backed by the designated foreign reserve currency.

To understand how a currency board works, suppose that for some reason all the households in a country suddenly decide to exchange all the money they have in their country's currency for dollars. Under a currency board system, this massive speculative attack against the local currency will not trigger a devaluation, as it did in Mexico, because a monetary authority adhering to a currency board rule never runs out of the reserve currency and can eventually buy back *all* the monetary base (that is, exchange it for foreign currency) with its reserves at the promised exchange rate.

Unfortunately, currency board advocates often fail to emphasize that the cost of successfully defending the parity between the reserve and domestic currencies may be a severe financial crisis. Lessons about the virtues and shortcomings of a currency board, as well as the events that led to Mexico's peso devaluation, can be drawn from a review of the recent economic experience of Argentina, a country that has been following a quasi-currency board rule very closely since 1991.

**Argentina's monetary policy and currency boards.** On April 1, 1991, Argentina's congress approved a convertibility law.[5] This law obligates the central bank to issue domestic currency (the peso) almost exclusively against the dollar value of foreign reserves at the fixed exchange rate of 1:1—in other words, at the rate of 1 peso for every $1 received by the central bank. This standard is the basic rule for money creation described in the previous section. Although many policy analysts refer to Argentina's current monetary regime as a currency board, the policy has not been run as an orthodox currency board rule. Even so, the policy so closely resembles a pure currency board regime that it serves as a useful example.

Figure 1 shows the evolution of the monetary base and foreign reserves in Argentina during 1995. On January 1, 1995, the foreign reserves were $15.7 billion, backing a monetary base of 16.3 billion pesos. The *MB$FR* ratio was very close to 1, the ratio stipulated by the currency board rule, so there was practically no difference between a currency board and Argentina's monetary regime on January 1.

If Argentina's policy were a textbook currency board, the two lines in Figure 1 would overlap throughout the figure. The lines do not overlap because, unlike an orthodox currency board, Argentina's convertibility law gives the central bank some flexibility to act as lender of last resort (Zarazaga 1995b). Argentina's central bank can issue money for that purpose up to the level that would push the *MB$FR* ratio above 1.25. Stated differently, the convertibility law does not require 100-percent backing of the monetary base: only 80 percent of it must be backed by foreign reserves (at the committed 1:1 exchange rate).

Had Argentina's policy been a pure currency board, when the country's foreign reserves shrank to about $10 billion in late March 1995, the monetary base would have shrunk by 5.7 billion to 10.6 billion pesos. However, Argentina's monetary base declined only to about 12.3 billion pesos. The *MB$FR* ratio peaked at 1.23 on March 30, 1995.[6] At that time, Argentina's central bank had $1 for every 1.23 pesos of bills and coins in the public's wallets and banks' vaults (or, equivalently, $0.82 for each peso of monetary base). Had the holders of pesos wished to exchange all their cash—the 12.3 billion pesos—for dollars, Argentina would have been forced to devalue its currency by about 23 percent.

Of course, this scenario overstates the risks of a devaluation in Argentina in March 1995 because it would be rare for all individuals and businesses simultaneously to want to rid themselves of the local currency. Some amount, even if modest, of bills and coins will always be needed to carry out transactions such as paying taxes or buying a soda in vending machines. Because some local currency will never be presented in exchange for dollars, the monetary base can grow slightly beyond the currency board limit.

The monetary authority can exploit this fact to manage the monetary base and expand it in moderate amounts, as Argentina's monetary authorities did, to act as lender of last resort. Although such a moderate expansion to help the financial system will not be backed by foreign reserves, the risk of a devaluation will be reasonable if policymakers do not abuse their leeway. Argentina's 80-percent coverage of the monetary base with foreign reserves, for instance, seems prudent.[7]

To summarize, Argentina's quasi-currency board rule has allowed its monetary authorities a little more flexibility in conducting monetary policy than an orthodox currency board would have. Still, Argentina's system imposes very clear limits on discretionary expansions of the monetary base. Monetary authorities respecting similar limits to their discretion within a fixed exchange rate regime will not be able to isolate changes in foreign reserves from changes in the monetary base for too long. Sooner or later, sustained declines in foreign reserves will be reflected in corresponding declines in the monetary base. This is why in Figure 1 the monetary base and foreign reserves in Argentina move in tandem, despite the flexibility built into the country's quasi-currency board regime.

**Argentina's quasi-currency board rule under attack.** When Argentina's peso came under speculative attack in first-quarter 1995, policymakers could defend the currency because they stubbornly adhered to a policy rule that guaranteed that at least 80 percent of the monetary base would always be covered by foreign reserves. But the price of this success was one of the most severe banking panics in modern Argentine history.

The performance of Argentina's quasi-currency board during a financial crisis illustrates that currency boards can avert devaluations. But because of their very limited ability to act as a lender of last resort, they introduce the risk that a minor, Orange County-type liquidity crisis[8] will become a devastating national financial panic almost overnight.

Argentina's case study demonstrates that currency boards have very little power to control financial crises when they occur in a modern, independent country, rather than in the colonies frequently cited as success stories in the literature of currency board advocates.[9]

Argentina's financial panic started with a liquidity squeeze in Bank Extrader, a small bank that held barely 0.2 percent of the total deposits in Argentina's financial system. Extrader was heavily exposed in Mexican bonds and securities. When the value of those assets fell dramatically in the aftermath of the devaluation of the Mexican peso on December 20, 1994, the bank could no longer cover its short-term liabilities, particularly some time deposits that came due. This shortage triggered a run against the bank. Extrader, unable to honor its deposits, was foreclosed on by the central bank on January 18, 1995.

The fear that other banks were similarly exposed translated into a generalized banking panic. Suddenly, Argentina's financial system was awash in the same indiscriminate chain reaction that had transmitted the tequila effect throughout Latin American capital markets. Almost immediately, the run against the banks became a run against the domestic currency. People feared that Argentina would devalue as Mexico had done shortly before. As depicted by the decline in foreign reserves in Figure 1, much of the cash withdrawn from Argentina's financial system went to purchase dollars that were sent abroad.

By the end of April 1995, Argentina's financial system had lost 18 percent of the deposits it had before the Mexican peso devaluation. As a measure of the severity of this contraction, Argentina experienced in just *three months* the same proportional contraction in deposits as the United States did during the first *two years* of the Great Depression. In the wake of Argentina's financial panic, many banks were forced to suspend the payment of deposits. Many investors—foreign and domestic alike—have yet to recover their savings. Argentina's experience, therefore, should dispel the notion that a currency board would have prevented the financial meltdown Mexico would have suffered without the U.S.–International Monetary Fund aid package.

The complete interruption of the chain of payments and shutdown of credit markets took its toll on Argentina's real economy. Second-quarter gross domestic product (GDP) in 1995 fell by about 5 percent from its second-quarter 1994 level, while the fall in third-quarter 1995 from third-quarter 1994 was 8 percent. These figures have led many private forecasters to conclude that Argentina's 1995 GDP (adjusted for inflation) will be 2.5 percent below that of 1994. Perhaps the most worrisome consequence of the financial crisis was a jump in the country's unemployment rate, from 12.5 percent in October 1994 to an all-time high of 18.6 percent in May 1995.

Numbers like Argentina's make it easy to understand why investors may fear countries will abandon currency board-like rules. When countries confront banking crises, such rules

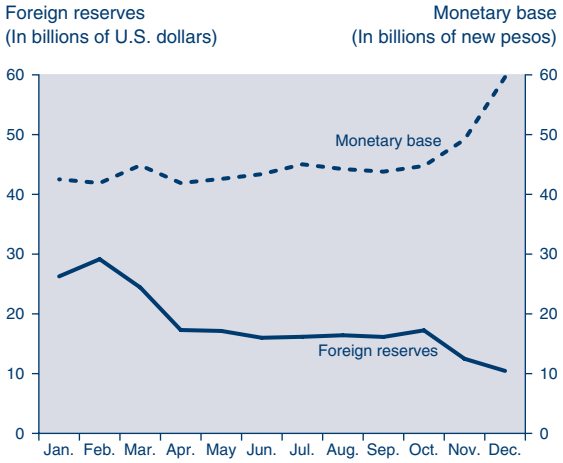
provide little more than homeopathic therapy while panics run their natural course.[10] As time inconsistency theory predicts, during times of stress, investors grow skeptical about governments' pledges to honor their commitments to currency board-like rules. Investors conjecture that rising unemployment and eroding political support might force governments to abandon the rule-bound currency board system and replace it with policies prone to devaluation—what the currency board was designed to prevent.[11] That time inconsistency problem is why investors questioned the continuity of Argentina's quasi-currency board rule and why they withdrew their savings from the country. This capital flight, in fact, helped generate the financial crisis that continued the cycle of devaluation fears.

Contrary to the predictions of currency board advocates, the formal legal arrangement of a quasi-currency board did not protect Argentina from a speculative attack against its currency. Argentina's monetary policy, as predicted, prevented a devaluation, but the price was a banking crisis far more severe than currency board advocates had anticipated.

**Mexico's discretionary monetary policy.** The movement of Argentina's monetary base and foreign reserves displayed in Figure 1 contrasts sharply with that of Mexico's. Figure 2 shows that Mexico's monetary base remained fairly constant and even increased after October 1994, despite a continuous decline in foreign reserves. The difference between the two figures suggests that Argentina was more conservative than Mexico in tolerating deviations from the currency board rule. The *MB$FR* ratio never reached the legal limit of 1.25 in Argentina but was 1.62 in Mexico on December 19, 1994, the day before the devaluation.[12] Undoubtedly, a devaluation is much more likely in a country that backs less than 80 percent of its monetary base with foreign reserves (as Mexico did in late 1994) than in a country that backs 80 percent or more of its monetary base with foreign reserves (as has been the case in Argentina).

Interestingly enough, until October 1994, Mexico had managed its monetary base according to a rule that far exceeded the rigor of the currency board standard. Before fourth-quarter 1994, Mexico's *MB$FR* ratio had been below 1 (that is, Mexico's foreign reserves had exceeded its monetary base). This observation suggests an alternative interpretation of Mexico's monetary policy. Perhaps what differentiated Mexico's experience from Argentina's is not that Argentina passed a law requiring a quasi-currency board

Figure 2
**Mexico: Monetary Base And Foreign Reserves, 1994**




SOURCE: Banco de México.

rule while Mexico did not but, rather, that sometime after October 1994 Mexico decided to repudiate its policy suddenly and almost without warning.[13]

In any case, Mexico's relatively high fourth-quarter 1994 *MB$FR* ratio implies that Banco de México was no longer in a position to exchange Mexico's entire monetary base for dollars at the promised exchange rate, and that, subject to a speculative attack, Mexico would eventually be forced to devalue its currency by about 60 percent.[14] Unfortunately, the fear of a speculative attack became self-fulfilling and triggered a chain of events that led to the December 20, 1994, devaluation.

But why did the Mexican monetary authorities allow the monetary base to grow without the backing of foreign reserves after October 1994? As Mexican monetary authorities later explained, a continuous drain of foreign reserves had started in February 1994[15] and had exposed the banking sector to the risk of a liquidity crunch. Concerned abut a banking crisis, Mexican monetary authorities tried to preempt a financial panic by acting as a lender of last resort. Discount window loans to allegedly troubled financial institutions expanded the monetary base beyond the level of foreign reserves (Zarazaga 1995b), leaving Mexico vulnerable to speculative attack and devaluation.

On face value, the expansion of Mexico's monetary base through its central bank's discount window—despite declining foreign reserves—may appear inconsistent with the pegged exchange rate regime in place at the time. The action, however, was not necessarily

inconsistent, provided the monetary authorities had reasons to believe that the capital outflows and consequent loss of foreign reserves were only temporary and would reverse themselves once the fears of political turmoil subsided,[16] and that the minimum demand for local currency had increased as well.

Banco de México authorities have stated that such reasons did indeed exist,[17] even if now, in hindsight, it may appear that the effects of political uncertainty on Mexico's creditworthiness were underestimated[18] and the increase in demand for Mexican pesos was overestimated.[19]

Undoubtedly, something went wrong. Mexico most likely suffered the same problem that has hit many other countries when their currencies have been devalued after their policymakers miscalculated the leeway they had for expansions of the money base not backed by foreign reserves. In the attempt to fine-tune the economy, even the most skilled policymakers may read the tea leaves incorrectly from time to time. In Mexico's case, the monetary authorities validated the use of the discount window—and, therefore, the increase of the unbacked monetary supply—to a level that, ex post, exceeded what the market was willing to absorb.[20]

If the source of the problem is not necessarily unskilled policymakers but the discretion they enjoy in conducting monetary policy (for example, to preempt bank runs), then the obvious fix would be to take away policymakers' discretion. This is the reasoning behind many enthusiastic recommendations in favor of currency boards and the focus of the next section.

## Can institutions eradicate discretionary policies?

Since a currency board is nothing but a rule for money creation, the debate about the advantages, disadvantages, and desirability of currency boards amounts to another rendition of the long-standing rules-versus-discretion debate. Currency board advocates maintain that the Mexican crisis would have been avoided if a currency board like Argentina's had limited the discretion of Mexico's monetary authorities. Although this argument might ring true, it naively attributes to formal rules and institutions more power than they have in committing governments to keep their promises in the face of adverse economic conditions.

The problem is that policy rules, however institutionalized, are inherently time inconsistent—in other words, governments will tend to abandon them. Advocates of currency boards have failed to show how such institutions can overcome this problem. As mentioned earlier, Argentina, despite its quasi-currency board, suffered a speculative attack driven by distrust in the continuity of its monetary policy.

Argentina's example further indicates that legal institutions per se provide very little reassurance about a country's future economic policies. In fact, during Argentina's financial crisis, Art. 17 of that country's central bank charter was modified by presidential decree to give that institution more flexibility in its discount window policies. That charter, approved by law number 24,144 of September 23, 1992, had enacted the central bank independence. But the presidential decree raised and justified the fears that the whole central bank charter and, therefore, central bank independence, would be repudiated. Another indication of how ineffective formal institutions and legal arrangements are in limiting policymakers' discretion comes from German history. The Reichsbank, the central bank of the German Empire, was declared legally independent on May 26, 1922, just three months before the onset of the 1922–23 German hyperinflation.[21]

Besides, neither Germany nor the United States has an explicit or legislated rule for running monetary policy such as Argentina's, yet Germany's or the United States' credibility in keeping inflation low and its currency stable far exceeds Argentina's because Germany and the United States have strong track records.

Far more important than what governments say—or even enact into law—seems to be what governments do: actions speak louder than words or laws. A country's care for its reputation plays a far more important role than its institutions in solving the time inconsistency problem and in providing governments with the incentives to adhere to policy rules despite the short-term temptation to do otherwise. This is the basic insight of Barro and Gordon (1983) and the literature that followed.[22] The credibility of policymakers and economic policies will be much higher in countries with a long tradition of respecting policy rules than in countries with a tradition of repudiating them.[23]

Given the role of reputation, new policy rules will meet considerable skepticism in countries that have failed to demonstrate past discipline. Guided by a country's history of repeatedly broken commitments, economic agents will (justifiably) bet against policy continuity, whether the government promises come in the form of

public statements or formal institutions such as currency boards.[24]

Formal institutions or laws cannot remove skepticism about governments' ability to carry out commitments in countries that have repeatedly failed to honor past promises. The adoption of rules in such countries, however implemented, sooner or later is likely to produce severe economic and social hardships while the country persuades investors that it has mended its ways and will no longer abandon its commitments.

## Are currency boards the best rule?

The failure to explain how currency boards solve the time inconsistency problem is not the only wrinkle in arguments that portray currency boards as the instant recipe for restored credibility and prosperity. But setting aside the issue of time inconsistency, there is the normative question of which is the best rule. What the literature has established is that optimal rules are superior to discretion.[25] A vast array of plausible policy rules and, in particular, of monetary policy rules is available to policymakers, and economists have yet to reach a consensus that currency board rules are superior to any other feasible rule.

Furthermore, many economists would argue that contingent rules are superior to ironclad ones that are invariant to changing economic contingencies. Several studies, in fact, show that rules with escape clauses are the best course of action.[26]

In this spirit, Bordo and Kydland (1995) argue that, despite appearing to be an ironclad rule, the gold standard in reality had implicit escape clauses. Bordo and Kydland point to periods when England, the country that most consistently adhered to the rule, temporarily suspended convertibility of the pound into gold (at a fixed exchange rate of £3.85 per ounce) during wars and financial crises.[27]

Admittedly, the use of rules with escape clauses opens a Pandora's box because rules with too many contingencies and escape clauses can become indistinguishable from discretion.[28] For example, did Mexico repudiate the fixed exchange rate rule through its extensive lender-of-last-resort activity just before the devaluation? Or, was Mexico simply exercising an escape clause to avert a financial crisis in the face of adverse and unforeseen political shocks, as England did to quench the incipient banking panics of 1847, 1857, and 1866? This will be the subject of considerable debate for many years to come, in part because several empirical and theoretical issues involved remain largely unresolved.[29]

But events in Mexico suggest that financial markets participants did not view the monetary policy actions at the end of 1994 as a temporary and justifiable use of an escape clause. Rather, the markets seem to have confused those policies with superficially similar ones that several years earlier (in 1982 and 1987) had led to devaluations accompanied or immediately followed by violations of elementary free market rules, such as nationalization of banks, confiscation of deposits, open or disguised forms of price and capital controls, and outright default on government debt. As in the tale of the boy who falsely cried wolf too often, Mexican policymakers in 1994 were trapped by the bad reputation of their predecessors.[30]

Perhaps one of the more important lessons of the Mexican crisis of 1994–95 is that the invocation of escape clauses might be unwise in countries that, in the eyes of investors, have abused such outs in the past.[31] For these countries, ironclad rules might well be the only hope to restore investors' confidence and, therefore, future prosperity. But this essentially sound point will be perhaps better served by the recognition that a currency board is just one type of ironclad rule, not necessarily, and certainly not in general, the best one.

Whichever ironclad rule proves best, it is necessary to revisit the issue of how it will overcome the time inconsistency problem. More concretely, will societies accept the immediate costs of implementing a rule, particularly severe in countries with a poor reputation, on the promise of the benefits that will accrue in time?

Minimizing or dismissing the costs of a particular ironclad rule in the zeal of promoting its adoption (as has often been done) could prove self-defeating because a society may too easily become disenchanted and abandon the rule at the first setback, before the rule has had time to take hold and produce the desired results. To the contrary, the cause of rules would be better served if scholars, decisionmakers, and opinionmakers clearly explained to societies the nature of the inevitable economic hardships the rules will entail after years of inconsistent monetary policy.

In this sense, Argentina's decision to respect the quasi-currency board rule despite its serious financial crisis is almost unprecedented. Perhaps Argentina's authorities (and Argentina's people, who reelected the government in the middle of the crisis) were motivated

to stick to their guns by a conviction that the alternative, to abandon the currency board, would have been perceived, as in Mexico, not as the use of an escape clause to control a banking panic but as a return to the old ways of running monetary policy. Such past policies were based on almost unbounded discretion and led to decades of impoverishing inflationary stagnation and to a traumatic hyperinflation during 1989–90.[32]

In any case, much of the difficulty policymakers face in choosing among different policy rules arises because the theory of costs and benefits of alternative policies is still well ahead of the empirical evidence available to measure them. For all their catastrophic dimensions, one potentially positive outcome of recent events in Mexico and Argentina might be to help close the theory–evidence gap. After all, those experiences are as close as economists get to controlled experiments needed to measure the costs and benefits of alternative policies: both are Latin American countries with similar characteristics and past histories, and each responded with a different policy to basically the same speculative attack against its currency. Of course, the task of identifying the effects of the different policies followed by those countries so far will not be as easy as the highly stylized, stark identifying assumptions just mentioned might suggest.

There are a number of other important factors that now or in the future could affect the economic outcomes of those two countries. But in economics, as in any other social science, the only feasible experiment is complex, sometimes fuzzy historical evidence, and few economists would argue that we have not learned anything from examining the past. Just the opposite is true, as few economists can resist the temptation of presenting data, which is information from the past, to back up their arguments and theories. It does not seem preposterous, therefore, to think that clever economists will be able to design appropriate quantitative methods to identify and measure cause–effect relationships between the eventually different economic performances and the so far certainly different policy responses of Argentina and Mexico. For that reason, the recent experiences of those two countries are already proving to be a popular and fertile area of research, one that might help assess the wisdom of Argentina's decision to stick to its quasi-currency board arrangement and, in any event, enrich and change the terms of the rules-versus-discretion debate for years to come.

## Conclusions

This analysis of the monetary policies of Argentina and Mexico has shown that, unlike Mexico, Argentina prevented a devaluation of its currency by following a quasi-currency board rule. Based on this observation, many have recommended a currency board for Mexico as well. This recommendation, however, is based on the naive belief that the formal institution of a currency board provides a commitment technology that ensures policymakers will conduct monetary policy according to a very well-defined rule.

The truth is that currency boards and similar institutions cannot enforce a government's everlasting commitment to low inflation and pegged or fixed exchange rate policies any more than a wedding ring can ensure a spouse's commitment to an everlasting marriage. This weakness is common to other institutions and written laws as well, and its source is the same: ironclad rules *do not* resolve the basic problem of time inconsistency. This problem lies at the heart of the lack of credibility that haunts policymakers in countries that have frequently broken their commitments in the past. This lack of credibility explains why currency boards are subject to speculative attacks that they can resist without devaluing only at the cost of very severe financial crises.

Therefore, depictions of currency boards—or any other ironclad rule, for that matter—as powerful devices that will magically restore investors' confidence and, therefore, prosperity almost overnight and without pain do not help. On the contrary, this optimistic assessment may have the perverse effect of providing policymakers with the incentive to abandon their commitments on the mistaken impression that later, simply by institutionalizing a rule such as a currency board, they can quickly and painlessly restore lost credibility.

In truth, a government's credibility is like crystal: once broken, it is very difficult and costly to restore. Rules would, perhaps, stand a better chance of overcoming the time inconsistency problem if the governments and societies of countries that abandoned past promises understood the true cost of regaining credibility. The costs of following a sensible monetary rule are the price to pay for the bad reputation that stems from a past of broken trust and for the future economic development that regaining credibility will eventually bring about.

Unfortunately, economic theory has made little progress in predicting when and why countries will finally abandon discretionary

policies and switch to rules, or, equivalently, when countries will perceive that future benefits of restored investor confidence outweigh the present economic hardships of rebuilding reputations.

In any case, societies considering commitment to a rule should consider that noncontingent policy rules such as currency boards are, in general, inferior to contingent rules. But because the distinction between pure discretion and contingent rules may become blurred in countries that have abused the flexibility provided by rules with escape clauses, such countries may have pushed themselves into an all or nothing situation. Ironclad rules may be the only rules previously deceived investors and financial markets participants will interpret as rules in such countries. But this is only conjecture that so far, to our knowledge, has not been formally proved. In this sense, the debate surrounding the convenience and effectiveness of currency boards is perhaps a red herring that distracts from the real issues, which are how to determine the best policy rule for countries that have frequently reneged on commitments and how to protect those rules from the continuous assault of the time inconsistency forces. Economists and policymakers still have a lot of thinking to do on both counts, especially after the recent economic experiences of Argentina and Mexico.

## Notes

I would like to thank Ken Emery, David Gould, and Owen Humpage for valuable comments on an earlier version of this article. I am grateful as well to Stephen Brown and Evan Koenig for insightful suggestions that were extremely useful in presenting my arguments. The editorial assistance of Rhonda Harris greatly improved the clarity and quality of the exposition. All remaining errors are mine.

[1] For a more detailed discussion of the tequila effect, see Zarazaga (1995a).

[2] Unfortunately, with the notable exception of Schwartz (1993), this insight has been lost in the currency boards literature.

[3] Although economists and social scientists have long been aware of this problem, (see, for example, Simons 1936), it was not until 1977 that it was formalized and brought to the forefront of the theory of economic policy by Kydland and Prescott (1977). For an excellent summary, see Taylor (1985).

[4] This article assumes the reader is familiar with the definition of the main monetary aggregates and, in particular, with the difference between primary expansion and secondary expansion of the money supply. See Zarazaga (1995a) for a brief and pedagogical exposition of these issues. For a more rigorous treatment, see Hanke and Schuler (1994) and Humpage and McIntire (1995).

[5] Law number 23,928.

[6] The stock of foreign reserves corresponds to the liquid foreign reserves net of domestic government dollar-denominated debt in the central bank's portfolio.

[7] The 2.3 billion pesos by which the monetary base exceeded the stock of foreign reserves at the end of March 1995 represented only about 1 percent of Argentina's GDP. It is unlikely that the demand for local currency will ever fall below that proportion of GDP, and, therefore, it was unlikely that in March 1995 Argentina's central bank would have had to buy back all the monetary base (12.3 billion pesos) with the $10 billion of reserves.

[8] This reference is to the 1994 insolvency of a small municipality in the United States that threatened to send that country's municipal bonds markets into a tailspin because of fear that other municipalities would default as well.

[9] For example, Hanke and Schuler (1994, 86) assert that "Failures by commercial banks have been minor in [currency board] systems." But the lessons that can be extracted from the historical experiences they reviewed are very limited because almost all such experiences have taken place in British colonies whose commercial banks were usually branches of international financial institutions. Those financial institutions had, as eloquently stated by Schwartz (1993, 182–83), "the resources to support a troubled local branch.…The London head offices of local branches provided lender of last resort services, if needed." In contrast, foreign banks were among the first to cut credit lines to their Argentine branches in the aftermath of the devaluation of the Mexican peso.

[10] It is important to emphasize that I do not claim that currency boards *create* banking crises, but rather that they have very limited ability to *prevent* them.

[11] This perception would not be totally unjustified. After all, as the next section explains, that is exactly what happened in Mexico at the end of 1994.

[12] According to Banco de México reports, on December 19, 1994, the stock of foreign reserves was $10.5 billion, while the monetary base was 59.6 billion new pesos. The dollar value of this monetary base at the exchange rate of 3.5 new pesos per dollar—that is, at the approximate exchange rate promised on the eve of the devaluation—implies a *MB$FR* ratio of 1.62.

[13] *MB$FR* ratios of 1.62 on December 19, 1994, and 1.12 on November 30, 1994, suggest explosive behavior in the intervening period. Indeed, in early December the monetary base grew about 22 percent, while foreign reserves fell around 16 percent. At least part of this expansion, however, may have been justified in the higher demand for currency typical of the month of December, when consumers need unusual amounts of cash to finance expenses related to Christmas.

[14] In fact, the depreciation of the peso was in that order of magnitude in the early phases of the floating exchange regime adopted after December 22, 1994.

[15] Although there is some debate about the underlying consequences of those capital outflows, it is symptomatic that foreign reserves fell by 40 percent in the twenty days immediately following a major political disturbance: the assassination of presidential candidate Luis Donaldo Colosio in March 1994. In fact, according to Calvo and Mendoza (1995), "Investors' prospects on Mexico's fundamentals *suddenly* changed, in part because of the increasing complexity of the ongoing political conflicts." [Emphasis added.]

[16] If Mexico's policymakers were mistaken in this regard, then they were in good company. As Calvo and Mendoza (1995) write, "Most of the information available until the end of 1994, including the assessment of international financial organizations, praised Mexico as a country with full balance in monetary and fiscal policies and set for strong future growth on the basis of its far-reaching reforms—*at about the same time the crash occurred, Mexico was accepted as a member of the OECD* [Organization for Economic Cooperation and Development]." [Emphasis added.]

[17] See, for example, Mancera (1995) for the Banco de México president's account.

[18] The inability to roll over the *tesobonos* debt (very short-term government debt adjusted according to the exchange rate) played a major role in the events that led to the crisis of December 1994. Interested readers can consult the study by Calvo and Mendoza (1995) and Cole and Kehoe (1995).

[19] Had Mexican monetary authorities had the recent econometric model of Kamin and Rogers (1995) and used it to predict the demand for currency, they would have forecast money demand growth below what they actually observed, especially for the first and third quarters of 1994. Had lower forecasts been used as a target in setting domestic credit (discount window) policies, the supply of monetary base would have grown at a slower rate than it actually did. Calvo and Mendoza (1995) use this finding to argue that monetary policy may have been too loose relative to the fixed exchange rate target and may have helped create the conditions for the speculative attack of late 1994.

[20] One could blame the policymakers for having missed several signs of the crisis to come. But many such signals could have been dismissed ex ante on the grounds that they reflected temporary factors containing very little information about more permanent economic imbalances. The exception, perhaps, is the money demand estimates mentioned in note 19. It is even possible to argue, as I do later, that Mexico was following a fixed exchange rate rule with an implicit escape clause, and that its policymakers merely exercised that escape clause in the face of extraordinary political events.

[21] Cottarelli (1993, Appendix II) points out that it is possible to identify countries—Belgium or Japan, for instance—whose central banks are not legally independent yet act much more so than the central banks of other countries that have theoretically independent central banks with the authority of written law. Cottarelli also discusses how the legal protection of the central bank can be and has been circumvented in the latter group of countries.

[22] See especially Lucas and Stokey (1983) and Chari and Kehoe (1990).

[23] This might explain why Canada, Belgium, and Italy have been able to sustain levels of government debt that, as percentages of GDP, are several times higher than the corresponding levels for Argentina, Brazil, and Mexico.

[24] It seems implausible that Mexico could restore its credibility with the simple announcement of a currency board law similar to Argentina's. Investors would question whether Mexico would adhere to yet another rule after abandoning its fixed exchange rate regime in October 1994.

[25] Examples of optimal rules are the Ramsey policies typically used as benchmarks of the analysis in the time inconsistency literature (see, for example, Chari 1988).

[26] Lucas and Stokey (1983), for example, construct models in which the optimal (Ramsey) policy is to abandon in the event of war the otherwise always honored rule of repaying the government debt. As Bordo and Kydland (1995) put it: "In an uncertain world, the Ramsey plan generally would be a contingent plan or rule. Strictly speaking, in a realistic environment the Ramsey plan would include many contingencies, some of which may make little difference to society's welfare."

[27] Bordo and Kydland identify these periods of suspension as 1797–1821 and 1914–25, which roughly correspond with the Napoleonic wars and World War I, respectively, and 1847, 1857, and 1866, which correspond to periods of banking panics.

[28] Bordo and Kydland (1995) state the problem well: "Drawbacks of including many contingencies, however, are lack of transparency and possible uncertainty among the public regarding the will to obey the original plan."

[29] Those who lean toward the second interpretation may point out that the assassination of presidential candidate Colosio qualified as a rare circumstance: no former or current president or presidential candidate has been assassinated in Mexico in the past fifty-six years.

[30] Thus, investors seem to have reacted not so much to fundamentals—that is, to economic policies—of the present but to those of the past. The same seems to be true about the causes of the bank panic that spread the tequila effect to Argentina, since according to a private report issued at the time, investors in that

country withdrew their money from the financial institutions on the concern that "the government might freeze bank deposits in order to stem a withdrawal of funds from the country" (according to a June 1, 1995, Bloomberg wire report) as it had done in 1990. The conjecture that Argentina's and Mexico's track records were catalysts of their financial crises could be of particular interest to scholars and policymakers because it suggests that reputation (and thus, past fundamentals) may play a major role in the genesis of herd behaviors like the one to which many analysts have attributed, at least in part, the speculative attacks against the currencies of Mexico and Argentina.

[31] This is an informal restatement of Chari's (1988) advice that "policy recommendations that ignore the effect of history on people's expectations will yield inferior outcomes" made in his insightful review of the extensions of the Barro–Gordon reputational framework to the case of contingent rules.

[32] Argentina's people and policymakers also may have been inspired by the example of their close neighbor, Chile. That country's rapid rate of growth over the past twelve years (GDP per capita has grown at an annual rate of almost 5 percent since 1983) is largely seen as the reward for the very strict monetary policies with which Chile responded in 1982 to a severe banking crisis. That crisis resulted in a decline of 15 percent in GDP and in unemployment rates in the same range as those Argentina is experiencing now.

## References


Barro, Robert J., and David B. Gordon (1983), "Rules, Discretion, and Reputation in a Model of Monetary Policy," *Journal of Monetary Economics* 12 (July): 101–21.

Bordo, M. D., and Finn E. Kydland (1995), "The Gold Standard as a Commitment Mechanism," in T. Bayoumi, B. Eichengreen, and M. Taylor (eds.), *Modern Perspectives in the Gold Standard*, (Cambridge: Cambridge University Press).

Calvo, Guillermo, and Enrique Mendoza (1995), "Reflection on Mexico's Balance-of-Payment Crisis: A Chronicle of a Death Foretold," mimeo, Board of Governors of the Federal Reserve System.

Chari, V. V. (1988), "Time Consistency and Optimal Policy Design," Federal Reserve Bank of Minneapolis *Quarterly Review*, Fall, 17–31.

———, and Patrick J. Kehoe (1990), "Sustainable Plans," *Journal of Political Economy* 98 (August): 783–802.

Cole, Harold L., and Timothy J. Kehoe (1995), "Self-Fulfilling Debt Crisis," unpublished manuscript, Federal Reserve Bank of Minneapolis and University of Minnesota.

Cottarelli, Carlo (1993), "Limiting Central Bank Credit to the Government: Theory and Practice," Occasional Paper 110, International Monetary Fund.

Hanke, Steve H., and Kurt Schuler (1994), *Currency Boards for Developing Countries: A Handbook* (San Francisco: International Center for Economic Growth).

Humpage, Owen F., and Jean M. McIntire (1995), "An Introduction to Currency Boards," Federal Reserve Bank of Cleveland *Economic Review*, Second Quarter, 2–11.

Kamin, Steven B., and John H. Rogers (1995), "Monetary Policy in the End-Game to Exchange Rate Based Stabilization: The Case of Mexico," unpublished manuscript, Board of Governors of the Federal Reserve Board.

Kydland, Finn E., and Edward C. Prescott (1977), "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy* 85 (June): 473–91.

Lucas, Robert E., Jr., and Nancy L. Stokey (1983), "Optimal Fiscal and Monetary Policy in an Economy Without Capital," *Journal of Monetary Economics* 12 (July): 55–93.

Mancera, Miguel (1995), "Don't Blame Monetary Policy," *Wall Street Journal*, January 31, A20.

Schwartz, Anna J. (1993), "Currency Boards: Their Past, Present, and Possible Future Role," *Carnegie–Rochester Conference Series on Public Policy*, 39 (December): 147–87.

Simons, Henry C. (1936), "Rules Versus Authorities in Monetary Policy," *Journal of Political Economy* 44 (February): 1–30.

Taylor, Herb (1985), "Time Inconsistency: A Potential Problem for Policymakers," Federal Reserve Bank of Philadelphia *Business Review*, March/April, 3–12.

Zarazaga, Carlos E. (1995a), "Beyond the Border: The Tequila Effect," *Southwest Economy*, Federal Reserve Bank of Dallas, Issue 2, 7.

——— (1995b), "Can Currency Boards Prevent Devaluations and Financial Meltdowns?" Federal Reserve Bank of Dallas *Southwest Economy*, Issue 4, 6–9.